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BRIEFER ARTICLES

A PROTOCOLM OF OPHIOGLOSSUM

(WITH ONE FIGURE)

In October 1908, Dr. CHARLES R. BARNES and the writer, while collecting bryophytes in a little known region of Mexico, botanically speaking, on the eastern edge of the great central plateau, about 150 miles northeast of Mexico City, on the boundary of the states of Hidalgo and Puebla, found great quantities of an *Ophioglossum*, which was distributed as *O. Pringlei* Underwood by the late Dr. C. G. PRINGLE.¹ The plants were in such numbers and varied so much in size that some days were spent in a thorough exploration of the region, hoping to find gametophytes. Of many hundred small plants, only one showed anything resembling a prothallus. After returning to Chicago, this supposed prothallus was sectioned and found to be a protocorm.

The protocorm, buried in the soil to a depth of 5 cm., is almost spherical and 9 mm. in diameter (fig. 1), with a slightly roughened surface caused by the irregular collapse of dead cells of the outer cortex. The leaf, including the petiole, is 13.5 cm. long, and shows no trace of a fertile spike. The remains of the leaf traces of five other leaves are present, showing that the protocorm is at least seven years old. The growing point is sunken in a pit made by cortical upgrowth. Numerous rootlets are penetrating the cortex in all directions, but only three or four in the upper region of the corm have reached the soil, and have partly decayed. The outermost cells of the cortex have lost their contents and collapsed, forming a protecting layer. These empty outer cells, as well as those of the partly decayed rootlets, are infested with fungal hyphae, which, however, do not enter the living cortical cells. The cells of the cortex are very full of starch.

¹The specimens were submitted to Dr. J. M. GREENMAN, who has made the following statement in reference to them: "Upon comparison of the material in collections determined as *O. Pringlei* with known species of this genus, I am unable to find a single character to separate it from our northern species *O. vulgatum* L. So far as I can find, *O. vulgatum* never has been definitely recorded from Mexico, but we have it represented from different stations from Canada and Maine to Arizona, and it would not be unparalleled by other cases to have it turn up in Southern Mexico. I should be inclined, therefore, to regard these Mexican specimens as conspecific with *O. vulgatum* L."

It was noticed that the plants with few exceptions were in groups of 3-10, usually radiating from a large plant. When the root system of these groups was laid bare, a work of no little difficulty because of the depth of the roots and the great number of roots of other plants in the soil, it was found that nearly all of the plants of a group were connected, and that the smaller plants were produced by adventitious budding of the roots of the larger plants. This method of vegetative reproduction is found in several species of *Ophioglossum*. Occasionally a leaf bears two fertile spikes.

The presence of a protocorm, and a method of vegetative reproduction so similar to *Phylloglossum*, may lead the unwary, or the "arm chair" botanist, to speculate concerning a possible relationship between Ophioglossales and Lycopodiales. It must be borne in mind that the protocorm probably has no phylogenetic significance whatever.

The region is one of exceptional interest to a botanist. The great central plateau falls sharply away to the low plain bordering the Gulf of Mexico. Rain and mist are abundant even in the dry season, because the clouds drift against the high eastern escarpment of the plateau. The border of the plateau is deeply dissected by the numerous small streams which fall over its edge and form box cañons, sometimes 500 meters deep. Because clouds continually drift up these cañons, their walls and floors are covered with dense masses of filmy ferns, liverworts, and mosses. On the high mesas between these cañons, but never in them, this *Ophioglossum* is most abundant. In the same situation *Lycopodium clavatum* and *L. complanatum* are also abundant. The species of *Lycopodium* and *Ophioglossum* are apparently confined to an altitude of about 2200 meters. At the same altitude, on the bank of a stream just before it plunges over the wall of a box cañon, a bog of volcanic ash and sphagnum was found.—W. J. G. LAND, *The University of Chicago*.



FIG. 1.—*Ophioglossum*: protocorm bearing sterile leaf.